

WHAT IS CLAIMED IS:

1. A method for performing a ranging operation by a subscriber station in a mobile communication system using a broadband wireless access scheme, the method comprising the steps of:

receiving, from a base station, backoff domains having a backoff start point and a backoff end point for each of rangings, determined according to priority levels of the rangings between the base station and subscriber stations;

performing a ranging operation with the base station, and selecting a backoff domain corresponding to a priority level of the performed ranging among the received backoff domains if the ranging fails; and

re-performing a ranging operation with the base station according to the selected backoff domain.

2. The method of claim 1, wherein the priority level is determined according to a service quality level of data provided to the subscriber stations and whether handover of the subscriber stations is performed.

3. The method of claim 1, wherein the step of re-performing a ranging operation with the base station according to the selected backoff domain comprises the step of re-performing a ranging operation with the base station at a particular time between the back start point and the backoff end point for the selected backoff domain.

4. The method of claim 1, wherein the backoff domains are determined so that a time period occupied by a backoff domain having a highest priority level becomes a shortest time period and a time period occupied by a backoff domain having a high priority level is shorter than a time period occupied by a backoff domain having a low priority level.

5. A method for performing handover for an access service on a common access channel in a mobile communication system using a broadband wireless access scheme, the method comprising the steps of:

receiving backoff domains having a backoff start point and a backoff end point for each of subscriber stations, when handover between a base station and the subscriber stations is performed;

checking the received backoff domains, and selecting a backoff domain for handover among the backoff domains; and

determining a backoff value corresponding to the selected backoff domain, and re-requesting ranging after waiting for the determined backoff value.

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6. A method for transmitting backoff values used for rangings between a base station and subscriber stations in a mobile communication system using a broadband wireless access scheme, the method comprising the steps of:

10 determining backoff domains having a backoff start point and a backoff end point according to a priority level of each of the rangings, for each of the rangings; and

transmitting the backoff domains determined for each of the rangings to the subscriber stations.

15 7. The method of claim 6, wherein the priority level is determined according to a service quality level of data provided to the subscriber stations and whether handover of the subscriber stations is performed.

20 8. The method of claim 6, wherein the step of determining backoff domains according to a priority level of each of the rangings comprises the step of determining the backoff domains so that a time period occupied by a backoff domain having a highest priority level becomes a shortest time period and a time period occupied by a backoff domain having a high priority level is shorter than a time period occupied by a backoff domain having a low priority level.

25 9. A method for performing a ranging operation in a mobile communication system using a broadband wireless access scheme, the method comprising the steps of:

30 periodically receiving by a subscriber station a broadcasting message and uplink channel information (UL-MAP) from a base station by detecting on a common control channel;

randomly selecting an access channel to be accessed through the uplink channel information, and then transmitting a ranging request message for an access in the selected access channel;

35 comparing the number of retransmissions of the request message with a predefined value, if reception of a response message from the base station exceeds a

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response waiting time;

comparing the number of retransmissions with an allowable access processing time if the number of retransmissions is smaller than the predefined value;

selecting a backoff domain according to a priority level of a service level if the number of retransmissions does not exceed the allowable access processing time; and

selecting a backoff value and calculating a backoff time from the selected backoff domain, and re-transmitting a ranging request message in the access channel if the calculated backoff time has passed.

10. The method of claim 9, wherein the priority is determined according to a service quality level of data provided to the subscriber stations and whether handover of the subscriber stations is performed.

11. The method of claim 9, wherein the step of re-performing a ranging operation with the base station according to the selected backoff domain comprises the step of re-performing a ranging operation with the base station at a particular time between the back start point and the backoff end point for the selected backoff domain.

12. The method of claim 9, wherein the backoff domains are determined so that a time period occupied by a backoff domain having a highest priority level becomes a shortest time period and a time period occupied by a backoff domain having a high priority level is shorter than a time period occupied by a backoff domain having a low priority level.

13. The method of claim 9, further comprising the steps of:
adjusting by the subscriber station a local parameter according to a response message, if the response message is received from the base station for the response message reception waiting time;

determining whether the adjusted parameter is normal, and performing error processing if the adjusted parameter is abnormal; and

re-transmitting an access request message on the selected access channel if the adjusted parameter is normal.

14. A handover method for requesting ranging when a subscriber station enters a network for handover in a mobile communication system, the method

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comprising the steps of:

upon receiving the request, transmitting by a base station backoff start information and backoff end information for handover; and

5 determining a backoff value for handover according to the backoff start and end information by a subscriber station that received the backoff start and end information.

15 15. The method of claim 14, further comprising the step of re-requesting ranging after waiting for a predetermined backoff value, if ranging fails when the subscriber station enters a network for handover.

10 16. A method for performing handover on a common access channel in a mobile communication system, the method comprising the steps of:

broadcasting, by a base station, information to cells over a forward common control channel periodically or an on-demand basis;

15 wherein the broadcasting step comprises the steps of:

broadcasting channel assignment information for an access channel corresponding to the common access channel to the cells periodically or an on-demand basis; and

20 broadcasting separation information of at least two backoff domains in at least one common access channel to the cells periodically or an on-demand basis.

17. The method of claim 16, wherein the broadcasting step comprises the steps of:

receiving an access request message of the subscriber station;

25 determining whether the base station is a system capable of providing a corresponding access service for the subscriber station; and

transmitting an access request response message including a connection identifier (CID) authenticated by a system that transmits the access request from the subscriber station.

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18. The method of claim 17, wherein the subscriber station corrects channel assignment information related to a received common access channel and assignment information of at least two backoff domains on at least one common access channel, and then performs access request on a common access channel.

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19. The method of claim 18, wherein the step of performing access request comprises the steps of:

selecting a backoff domain according to an access type; and

calculating a time for re-transmitting an access request through an exponential
5 backoff algorithm corresponding to the backoff domain.

20. The method of claim 18, wherein the subscriber station acquires information on pseudo-random codes assigned to the cells where a base station newly selected by detecting on the common access channel is located.

21. The method of claim 18, wherein after the base station correctly receives assignment information of a common access channel and assignment information of at least two backoff domains for at least one common access channel known to cells in service, if the subscriber station initializes an access request, a backoff
15 value in a backoff domain corresponding to a backoff algorithm for determining a time for re-initializing an access request in a selected common access channel is randomly selected in a wireless network system,

22. The method of claim 17, wherein the access request message of the
20 subscriber station includes:

an initialized access request message requested to the base station by the subscriber station for a handover processing time;

a network access request message for a field indicating a handover request type including handover; and

25 an access request response message transmitted to the subscriber station by the base station after normally receiving an access request message from the subscriber station and determining whether the base station can provide a corresponding access service for the subscriber station.

23. The method of claim 22, wherein the network access request message for handover is acquired by adding a field defining a handover request type to an initial
30 access request message.

24. The method of claim 22, wherein the network access request message
35 for handover is an access request message using information on previously assigned

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pseudo-random codes.

25. The method of claim 22, wherein the access request response message is a message transmitting a particular connection identifier (CID) authenticated by an access request of the system.

26. The method of claim 22, wherein when the subscriber station initializes the access request message of the base station, the network access request message for handover is acquired by adding fields defining a developed uplink access channel and fields defining a handover request type of an initial access request message (RNG-REQ).

27. The method of claim 22, wherein the method of generating and assigning pseudo-random codes used by a system for defining a network access request for a handover time comprises the step of acquiring a partial sequence of a long pseudo-noise code based on a result value of a ranging code generator as pseudo-random codes used by the system for defining a network access request for hard handover.

28. The method of claim 27, wherein the step of acquiring a partial sequence of a long pseudo-noise code based on a result value of a ranging code generator as pseudo-random codes used by the system for defining a network access request for hard handover comprises any one of the steps of:

assigning pseudo-random codes used by the system defining the network access request for hard handover to each cell by the system; and

dynamically assigning pseudo-random codes used by the system defining the network access request for hard handover to each of the cells according to a request of each of the cells.

29. The method of claim 28, wherein the pseudo-random codes used by the system defining a network access request for hard handover are formed by a partial sequence of a long code.

30. The method of claim 29, wherein the long code is formed by a result of a polynomial generator of $1+X^1+X^4+X^7+X^{15}$ for a ranging code.

31. The method of claim 27, wherein H pseudo-random codes required according to the access request for handover are generated with a partial sequence of long pseudo-noise codes which are a result of a polynomial generator of $1+X^1+X^4+X^7+X^{15}$ for a ranging code under an OFDMA operation mode.

32. The method of claim 31, wherein codes formed by clocks of the H pseudo-random codes do not interwork with codes formed by the clocks of the pseudo-random codes.

33. The method of claim 31, wherein sets formed by the partial sequence of long pseudo-noise codes include:

a set A having N codes at a start point, a set B having M codes following the N codes, a set C having L codes following the M codes, and a set D having H codes following the L codes;

wherein pseudo-random codes used for initial ranging, periodic ranging and bandwidth request ranging, and access request functions for hard handover constitute an individual set for pseudo-random codes, and are used to individually select one set.

34. The method of claim 33, wherein a start of the N codes corresponding to the set A previously output from the long code is used for initial ranging and has one of 0^{th} to $(106*N-1)^{\text{th}}$ clocks according to a result of a generation equation;

wherein the M codes in the set B following the N codes are used for periodic ranging and $(106*N)^{\text{th}}$ to $(106*(N+M)-1)^{\text{th}}$ clocks are selected;

wherein the L codes in the set C following the M codes are used for bandwidth request ranging and $(106*(N+M))^{\text{th}}$ to $(106*(N+M+L)-1)^{\text{th}}$ clocks are selected;

wherein the H codes in the set D following the L codes are used for an access request function for hard handover and $(106*(N+M+L))^{\text{th}}$ to $(106*(N+M+L+H)-1)^{\text{th}}$ clocks are selected.

35. The method of claim 27, wherein the pseudo-random codes used by a system defining the network access request for handover statistically assign a system to cells of base stations.

36. The method of claim 27, wherein the system defining the network access request for handover transmits other identifier (ID) information in each of cells

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and an identifier of pseudo-random codes assigned to the cells over a forward common control channel periodically or on an on-demand basis, and acquires at least one of information on pseudo-random codes assigned to the position-estimated cells of a base station newly selected by a subscriber station through detecting on a common control channel.

37. The method of claim 36, wherein the pseudo-random codes used for a system for defining the network access request for handover are dynamically assigned to the cells by the system according to requests of the cells, and each of the cells transmits at least one of an identifier of the pseudo-random codes assigned to the cell and another identifier information to the cell over a forward common control channel periodically or on an on-demand basis.

38. The method of claim 16, wherein if the subscriber station initializes an access request after receiving assignment information of the common access channel and separation information of at least two backoff domains for at least one common access channel, the subscriber station randomly selects a backoff value in a backoff domain corresponding to a backoff algorithm for determining a time for re-initializing an access request in the selected common access channel.

39. A handover apparatus for providing an access service on a common access channel in a mobile communication system, the apparatus comprising:

a subscriber station that requests ranging as it enters a network for handover;
and

a base station that transmits handover information to the subscriber station;
wherein when the subscriber station requests ranging as it enters the network for handover, the subscriber station receives backoff start information and backoff end information from the base station and determines a backoff value for handover according to the received backoff start information and backoff end information.

40. The handover apparatus of claim 39, wherein the subscriber station re-requests ranging to the base station after waiting for the determined backoff value when the ranging fails.

41. The apparatus of claim 39, wherein the backoff start information is

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formed with an initial backoff window size for performing initial ranging of the subscriber station for a handover processing time.

42. The apparatus of claim 39, wherein the backoff end information is formed with a final backoff window size for performing initial ranging of the subscriber station.

43. An apparatus for performing a ranging operation in a mobile communication system using a broadband wireless access scheme, the apparatus comprising:

a subscriber station for receiving and selecting, from a base station, backoff domains having a backoff start point and a backoff end point for each of rangings determined according to a priority level;

wherein if the subscriber station fails to perform ranging, the subscriber station selects a backoff domain corresponding to a priority level of the ranging among the received backoff domains and re-performs a ranging operation with the base station according to the selected backoff domain.

44. The apparatus of claim 43, wherein the priority level is determined according to a service quality level of data provided to the subscriber stations and whether handover of the subscriber stations is performed.

45. The apparatus of claim 43, wherein the operation of re-performing a ranging operation with the base station according to the selected backoff domain comprises re-performing a ranging operation with the base station at a particular time between the backoff start point and the backoff end point for the selected backoff domain.

46. The apparatus of claim 43, wherein the backoff domains are determined so that a time period occupied by a backoff domain having a highest priority level becomes a shortest time period and a time period occupied by a backoff domain having a high priority level is shorter than a time period occupied by a backoff domain having a low priority level.

47. An apparatus for transmitting backoff values used for rangings of

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subscriber stations in a mobile communication system using a broadband wireless access scheme, the apparatus comprising:

5 a base station for determining backoff domains having a backoff start point and a backoff end point according to a priority level of each of rangings, for each of the rangings, and transmitting the backoff domains determined for each of the rangings to the subscriber stations.

10 48. The apparatus of claim 47, wherein the priority level is determined according to a service quality level of data provided to the subscriber stations and whether handover of the subscriber stations is performed.

15 49. The apparatus of claim 47, wherein the backoff domains are determined according to a priority level of each of the rangings so that a time period occupied by a backoff domain having a highest priority level becomes a shortest time period and a time period occupied by a backoff domain having a high priority level is shorter than a time period occupied by a backoff domain having a low priority level.